

## ABSTRACT

A communication system is disclosed that encodes multiple bits of digital data on a single analog signal cycle. The communication system includes a digital data encoding system that receives the multiple bits of digital data and looks up the digital data in a Digital-to-Analog (D/A) conversion table. The D/A conversion table correlates the multiple bits of digital data to amplitudes of an analog signal and yields amplitudes values. The digital data encoding system then generates the analog signal cycle based on the amplitude values. The digital data encoding system advantageously increases the bandwidth available to customers, which is particularly important to help solve "last mile" bandwidth problems. The communication system also includes a digital data decoding system on the receiver side that decodes the multiple bits of digital data from the analog signal cycle using an Analog-to-Digital (A/D) conversion table.